**WATER, WASTE AND ENERGY SUSTAINIBILITY**

**FINAL PAPER**

**SUBMITTED BY: DERYL CHANDLER-MASON**

**TOPIC: BOTTLED OR TAP WATER?**

**DATE: 12/1/13**

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**NYS STANDARDS/COMMON CORE:**

***LE7.2b, c; LE7.2d; LE.5.1c, LE6.2a; ICT 5.2; IPS1.1-1.4; IPS2.1***

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**COMPETENCIES BASED ON DANIELSON’S FRAMEWORK:**

**1e: Designing Coherent Instruction 3c: Engaging Students in Learning**

**2b: Establishing a Culture for Learning 3d: Using Assessment in Instruction**

**2c: Managing Classroom Procedures 4a: Reflecting on Teaching**

**3b: Using Questions and Discussions**

**RELATIONSHIP WITH BLOOM’S TAXONOMY:**

**The steps used in this lesson include the following: 1) Information gathering (description, identify, write) 2) Making use of the knowledge (a question, choose) 3) taking apart some of the key facts ( analyze, select) 4) Judging the outcome (judge, compare and group discussion) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**TITLE: THE SUSTAINABILITY CHALLENGE: MEETING THE NEEDS OF WATER/ENERGY/WASTE-CONSERVING RESOURCES**

**GRADES: Middle and High School levels**

**UNIT: WATER**

**MOTIVATION/BRIDGE: (connecting relevancy to students’ lives): The students have learned about water and the water cycle. The students have learned about the importance of water and its many uses.**

**MATERIALS/RESOURCES: Bottled water, tap water, cups, notebook and pen/pencil**

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**ACTUAL LESSON PLAN: The aim is to have students learn about water and the choices we make when drinking water.**

**INSTRUCTIONAL OBJECTIVES:**

* **Students will learn the different reasons why people buy bottled water.**
* **Students will learn the different reasons why people choose to drink tap water.**
* **Students will gather information about the positive and negative aspects of bottled and tap water.**
* **Students will conduct research on all of the different water sources.**

**PERFORMANCE OBJECTIVES:**

* **Students will be able to make a prediction about which water will be their preference.**
* **Students will perform an experiment to find out which type of water is preferred.**
* **Students will analyze the results. (count the number of responses for bottled vs. tap)**
* **Students will make a conclusion and discuss their findings.**

1. **INTRODUCTION-SCIENTIFIC METHOD:**

**The students will follow these steps during this lesson:**

1. **QUESTION: Which water tastes better?-Bottled or tap**
2. **HYPOTHESIS: The students will predict which water they might prefer.**
3. **CONDUCT THE EXPERIMENT: The students will taste both types of water and decide which water tasted better.**
4. **WRITE DOWN THEIR RESULT: The students will write down their preference.**
5. **ANALYZE THE RESULTS: The responses will be tallied and the results will be shared with the class.**
6. **CONCLUSION: Based on the findings, the entire class will discuss the final results.**
7. **REASONS WHY SOME PEOPLE PREFER BOTTLED OR TAP WATER:**
8. **The students will write down reasons for each- For example, some people feel bottled water tastes better and tap water is easily accessible.**
9. **In a large group, the students will discuss the different reasons and which type do they drink and use at home.**
10. **WATER EXPERIMENT:**
11. **Each student will drink bottled and tap water.**
12. **The students can not talk about their preference with their classmates.(This may influence the final outcome.)**
13. **Each student will record which type of water tasted better. (by secret ballot)**
14. **TALLY THE RESULTS:**
15. **Teacher/Students will count the responses and determine which water was preferred by the group.**
16. **The entire class will have a discussion about the results.(\* The majority of the students chose the bottled water.)**
17. **CONCLUSION:**
18. **Students will determine why the bottled water was the most preferred.**
19. **The students will write down the responses.**
20. **Share with the class the data/ research information comparing bottled and tap water. (courtesy of Green Design Lab/Solar One 2011)**

**\*\* HOMEWORK ASSIGNMENT: The students will be asked to gather information on their own about the data/research done comparing bottled and tap water.**

**ASSESSMENT: The instructional and performance objectives were both met. Each student was involved in the lesson. They also were able to answer questions and demonstrate an understanding of the topic.**

**ENRICHMENT: The entire class could relate to the subject matter. Water is essential to our everyday life.**

**TEACHER NOTE: There is another way this lesson can be done. They can guess which water is bottled and tap. It may be more interesting if they are not told which is bottled or tap water.**

**TEACHER REFLECTION: The students were very engaged during this lesson. They were excited to find out about the end results. I was able to get their attention and have discussions about what they discovered. This experiment was fun and a learning experience for each student.**

Experiment Rubric (Making a Comparison)

| Score Levels | Information | Experiment | Decision-Making Process | Discussion |
| --- | --- | --- | --- | --- |
| 4 | * The student understands the topic and subject matter. * Personal opinions, conclusions or inferences are avoided. * Thoughtful and relevant questions are asked. | * Student stays on task. * Student understands the question to be solved. * Student predicts and draws a conclusion. | * Student has great insight and excellent decision-making skills. * Scientific method is evident. * Student follows all the steps of the scientific method. | * Student participates in the discussion. * Student demonstrates an understanding of the task assignment. * Student is very articulate and others understand him/her. |
| 3 | * The student understands some of the topic and subject matter. * Some personal opinions are avoided. * Some questions are thoughtful and relevant. | * Student hardly stays on task. * Student does not have all the information to answer the question. * Student has a prediction and/or conclusion. | * Student shows some insight and good decision-making skills. * Some aspects of the scientific method are evident. * Some of the steps of the scientific method are followed. | * Some participation is noted. * Student has some understanding of the task assignment. * Student speaks in a clear and concise manner. |
| 2 | * Very little evidence that the student understood topic. * A few personal opinions were noted. * Very few questions noted. | * Minimal focus on the task. * Very little information about the question. * Student does not have a prediction but has a conclusion. | * Very little insight and decision-making skills noted. * Very little evidence of the scientific method being used. * Few steps of the scientific method are followed. | * Minimal participation. * Little understanding of the task assignment. * Speaks clearly. |
| 1 | * Student did not understand topic and subject matter. * Personal opinions were not avoided. * Thoughtful and relevant questions were not evident. | * Student is not on task. * Student has no information about the question that needs solving. * Student does not have a prediction or a conclusion. | * Insight and decision-making skills are not evident. * Scientific method not used. * Steps of the scientific method are not used. | * No participation in a discussion. * Shows no understanding of the task assignment. * Needs to speak in a clearer and concise manner. |